CHAPTER 7

CEMENT CONCRETE APPROACHES

Introduction

This item includes road and street approaches. Since these are built the same as Portland cement concrete pavement, which is covered in another manual, it will not be discussed here.

This section will discuss the construction requirements for private and commercial concrete drives. It will set out the requirements from grade preparation to final measurements.

Private and Commercial Concrete Approaches

This section will deal with the construction of cement concrete approaches for various classes of commercial drives, private driveways, and mailbox approaches. The construction techniques for each are basically the same, the differences lying in the thickness, shape, and classification of each.

The type or class of drive will be specified in the plans. Details of these can then be found on Standard Sheets 610-PRAP-14, 610-DRIV-01, 03, 08, and 15.

Grade Preparation

Grade preparation for commercial and private approaches is much the same as for concrete pavement. This is discussed in greater detail in the Concrete Paving Manual, so we will touch only on the highlights here. You may wish to read Section 207 of the Standard Specifications for further information.

The top 6″ of the subgrade must be compacted to 100% of its maximum dry density . If any of the subgrade material is found to be soft or yielding or cannot be satisfactorily compacted, it must be corrected or removed.

During subgrade preparation and after its completion, adequate drainage must be provided to prevent water from standing on the subgrade, but uniformily moist prior to concrete placement.

Forms

Wood or metal forms are generally required for cement concrete approaches. They must be of sufficient strength to resist springing and have enough stakes, pins, or bracing to firmly hold true to line and grade during placement of the concrete. The alignment of the forms shall not deviate more than ¼″ in the horizontal direction from the planned PCCP width tangent sections. Forms shall be staked into place with a minimum of three pins for each 10′ section. A pin shall be placed at each side of every joint. Form sections shall be locked tightly and be free from play or movement in any direction. Forms shall also be clean and oiled prior to the placing of concrete.

When a construction joint or a dowelled joint is required, the forms used must be drilled or slotted to allow for the placement of the steel or dowels.

Concrete Composition & Placement

The concrete used for public and commercial drives may be paving concrete as set out in Section 500 of the Standard Specifications or class A concrete as set out in Section 702. Proper consolidation of the concrete is extremely vital to the integrity of the approach. Consolidation will take place through use of proper vibration equipment. Vibration equipment shall consolidate the full width and depth of the strip of PCCP being placed. Vibrators may be either the surface pan type or the internal type with either immerse tube or multiple spuds.

Finishing & Curing

Portland cement concrete for approaches shall be finished with equipment in accordance with the Standard Specifications. Hand Methods of finishing may be used when finishing equipment breaks down or in tight working areas where field conditions limit the use of mechanical devices. Hand placed concrete shall be further finished by means of a longitudinal float or an approved transverse smoothing float.

The operation must be performed such that an excess of mortar and water is not worked to the top. Segregated particles collecting in front of the screed must be thoroughly mixed into the unfinished concrete already on the subgrade, being careful to keep a sufficient roll of material in front of the screed. This will help prevent depressions or “duck ponds” from forming in the approach.

After final strike-off, floating is performed to achieve a more true and even surface. All edges are finished using a ¼” radius edging tool. Finally, the textured surface of the approach shall be tined, unless otherwise specified. Tining shall consist of transverse grooves that are between 3/16 and 1/8 of an inch in width and between 1/8 and 3/16 of an inch in depth.

Curing is required for a period of 96 hours after placement of the concrete. This is normally achieved by covering the approach with plastic sheeting or blankets, or by the use of curing compound. Other methods are discussed in the Concrete Paving Manual and may be used as well. If there is the danger of freezing, sufficient straw or blankets must be used to prevent the concrete from freezing during curing.

Joints

Joint requirements are spelled out on the Standard drawings, some of which are included in this manual. Joints that may be required are longitudinal joints, expansion joints, keyway joints, and ear construction. Joints are discussed in more detail in the Concrete Paving Manual.

Concrete Approach Thickness

The Contractor shall obtain cores at the locations determined by the Engineer in accordance with ITM 802, for the purpose of obtaining the actual thickness of the in-place approach. One core shall be taken for each 1200 square yards, no core is required when less than 1200 square yards are placed. Cores, 4″ in diameter, shall be taken in the presence of the Engineer for the full depth of the portland cement concrete approach. The Engineer will take immediate possession of the cores. Cores shall not be taken within 2′ of the edge of pavement, over dowels, or within 5′ of a transverse construction joint. Cores shall be taken and measured by Department personnel. Core holes will then be filled according to Standard Specifications. The Concrete Paving Manual covers more detail on corrective actions when a core is found to be deficient.

Opening to Traffic

As in pavement, approaches must be closed to traffic for 14 days after placement or until the test beams indicate a modulus of rupture of at least 550 psi. If fly ash is used in the concrete, the 14 day rule will not apply. Only the strength of the concrete determined by test beams indicating a modulus of rupture over 550 psi, will determine when the approach may be opened to traffic.

Construction & Inspection Procedures

It is important to have a firm, solid subgrade. Check all dimensions, length, width, and depth before concrete is poured.

Be sure to place a string or other device across the top of the forms the way the concrete will be struck off or your depth check will not be correct.

If the drive is over 10’ in length and not reinforced, a transverse joint should be placed so that no section of the drive is over 10’ long. Be sure to check joint depth and location as shown in the standards.

Opening to traffic has to be controlled so that premature cracking or damage to the drive does not occur. Close adherence to curing requirements will also help prevent damage.

Perform all on-site testing of materials according to the frequencies stated in the frequency manual and check to see that materials are approved for use. Secure all required basis for use for material records.

All items must be measured and documented for payment on a daily basis. These measurements shall be accurate enough for final payment so that additional measurements will not be required at a later date.

Measurement & Payment

Portland cement concrete for approaches will be measured by the square yard of the thickness specified and paid as Portland Cement Concrete Pavement. The length and width of the approach will be as shown on the plans.